(11) 414085

COMMONWEALTH OF AUSTRALIA

PATENT SPECIFICATION (21) 1022/66

Class (52) 87.2; 57.5; 57.1.

Int. Cl. (51) A61f; B65d.

Application Number (21) 1022/66.
Lodged (22) 1st February, 1966.
(Accompanied by a Provisional Specification)

Complete Specification entitled (54) AN IMPROVED DISPENSING CONTAINER.

(Cognate with 7078/66)

Lodged (23) 31st January, 1967.
Accepted (44) 14th June, 1971.
Published (41) 1st August, 1968.

Convention Priority (30) -

Applicant s (71) NOEL JAMES BONNIN M.S. F.R.C.S. F.R.A.C.S. and IAN HOWARD MUDIE ROEGER.

Actual Inventor s (72) NOEL JAMES BONNIN, M.S. F.R.C.S. F.R.A.C.S. and IAN HOWARD MUDIE ROEGER.

Related Art (56)

259,021(8660/61)	57.1; 87.2
17,016/34	87.2; 27.7
221,398(26,755/57)	87.2; 57.5.

The following statement is a full description of this invention, including the best method of performing it known to us :

21793/70—L W. G. Murray, Government Printer, Canberra

111-1D-8/7/71-15P.C.

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This invention relates to an improved dispensing container and in particular it relates to a container which is adapted for dispensing liquids of any kind but which has as a special object the dispensing of medical supplies either by ejection through a nozzle or through a hypodermic needle. It is particularly useful for injecting a jelly or ointment or the like into the urethra or other body orifice, in which case the container would be fitted with a nozzle of suitable shape, or for injecting morphine or other substances in which case the container could be fitted with a needle in a similar manner to a syringe.

I am aware that many types of dispensing containers and syringes have been used in the past, amongst which were those which were charged with a liquid and in which the liquid was held in a sealed condition prior to application.

With many of the medical liquids or pastes which are dispensed in single dose, or multiple doses, it is now customary to seal the medicament in the container and to dispense same directly from the container through a nozzle or needle after cutting or removing a sealing member by means of which the content is kept in an aseptic and sterile condition, but with the syringes and dispensers used heretofore a difficulty has usually occurred in maintaining aseptic conditions, particularly where plungers and the like were used, and also the cost of these units was excessively high for single dose usage.

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The invention is of course not to be confused with dispensers in the form of collapsible tubes in which a nozzle is cut or pierced prior to use, or in which a cap is removed, because these are of a semirigid nature only and do not allow effective manipulation of a nozzle or needle on same, this generally requiring a rigid construction for best effects.

As in the discharge from the nozzle of a container aseptic conditions must be maintained, particularly where the content is to be injected into an orifice in a patient, it is essential that the end of the nozzle be protected and smoothly contoured and thus be free of any sharp or cutting edges, and an object of the present invention is to form the nozzle in such a way that the hollow of the nozzle is closed by a sealing projection which can however be removed without cutting by a scissors or the like which would not only contaminate the end if not sterilized but would also leave a rough edge.

The improved sealable squeezable dispensing container thus comprises a body comprised of two spaced walls of differing relative rigidity to form the container, the wall of greater rigidity being relatively rigid and joined to a nozzle terminating at its end in a smoothly contoured edge, the dispensing being achieved by deflecting the less rigid wall toward the relatively rigid wall, characterized in that the end of the nozzle is closed by a sealing member joined to the nozzle by a frangible membrane disposed interiorly of but adjacent the end of the nozzle, whereby when the sealing member is removed by fracturing the membrane, the nozzle is maintained at its end with the smoothly contoured edge.

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In a preferred form a cap is used which engages a projection on the nozzle, and which also covers at least the end of the nozzle to hygienically protect same, the cap so engaging the projection that when the cap is rotated or twisted or otherwise moved, a membrane will shear off within the nozzle, inwards from its forward end, and the sealing projection will be withdrawn with the cap.

Such a container can for instance be formed of nylon or any other suitable plastics material and will have its wall of

varying thickness or shape so that there is a main part of relatively rigid contruction, joined to the dispensing nozzle or the like, by means of which the unit can be handled and another part which is in the nature of a membrane so shaped that it can be pressed into the rigid part by the thumb or the finger of the user to eject the content.

Obviously the shape of the unit can be widely varied and for instance a base of rigid material could be formed which corresponds in shape somewhat to the underside of a person's thumb and which has at its one end a nozzle or needle or needle boss and has its other end shaped so that it may be closed by any suitable sealing means, this section continuing into a relatively flexible wall or membrane which is domed upwardly over this lower shape, the whole assembly being so arranged that when the unit is held in the hand with the thumb on the less rigid wall, pressure on the wall will force the wall down into the unit to displace the content through the outlet.

Such a device can have a somewhat flattened shape for ease of handling and if the flexible wall is correctly shaped in relation to the inside shape of the more rigid wall, it will be realised that the less rigid wall can readily be displaced from an outwardly domed position into an inward position where it fits neatly to the floor of the relatively rigid part of the unit, and moreover if the shape is designed to just accommodate the user's thumb, then a simple and effective dispenser results which

can be cheaply produced, which can be completely sealed to hold in the content, and which has no movable parts such as pistons or plungers or the like, the less rigid wall preferably being moulded integrally with the main body of the container although this would not always be essential.

To enable the invention to be fully appreciated, embodiments thereof will now be described with reference to the accompanying drawings in which:-

Fig. 1 is a perspective view of an uncharged container,

Fig. 2 is an underside view of same,

Fig. 3 is a side elevation of a charged container

Fig. 4 is a perspective view of a charged container with a protective cap thereon,

Fig. 5 is an enlarged central section of a cap and the end of a nozzle according to a modification, showing the cap removed from the sealed nozzle,

Fig. 6 is a similar view but showing the cap in place on the nozzle to protect the end of the nozzle against contamination,

Fig. 7 shows how by twisting the cap, the sealing membrane is sheared to remove the sealing projection, and

Fig. 8 shows a modified cap and nozzle.

It will be clear that the invention need not necessarily be limited to any of the embodiments shown in the above-referred to illustrations, the scope of the invention being defined by the claims herein.

Referring first to Figs. 1, 2 and 3 in which a simple container is shown a nozzle 1 which is closed at its outer end but is adapted to have this end opened by means described below, tapers to a larger area so that an upper wall 2 and a lower wall 3 between them complete the container, the moulding being however carried out in such a manner that the upper wall is more flexible than the lower wall and the device generally being of a size such that the upper wall is adapted to fit a thumb so that when the device is held in the hand some pressure on the upper wall 2 will permit this wall to be forced down onto the lower wall by flexing at the edges 4 and to thus expel

any medicament which is held within the container between the walls 2 and 3.

When the container is formed it is of course open at the rear end 5 but after filling this end is sealed in any suitable manner such as by heat-sealing or by welding together the edge portions at the rear end by heat or other means, and the container then takes on the appearance shown more particularly in Fig. 3 and in this form is ready for transport and use.

It will be noted from Fig. 3 that the nozzle 1 has at its end a closure member 6 which takes the form of the device as later described herein, and is removable when the content is to be ejected, the lower wall 3 being provided with stiffening ridges or corrugations 7 as shown also more particular in Fig. 2 so that this lower section has a greater rigidity than the upper wall 2 and therefore when the device is held in the hand with the thumb on the upper wall 2, pressure on this upper wall will eject the medicaments out of the container through the open nozzle 1.

Obviously instead of using stiffening ridges or corrugations 7 it would be possible to simply have this portion of the container of thicker form so that it has greater rigidity, but it will be realised that in all cases the device is intended for use where a medicament or the like is to be ejected through a nozzle, either directly into an orifice in the patient or by fitting a needle or other device to the nozzle 1

to allow the content of the container to be ejected.

The device would be made of a dimension such that the wall 2 can be conveniently covered by the thumb of the user and it will be realised that as the lower wall 3 is more rigid than the upper wall and continues to form the nozzle 1, which is thus held rigid in relation thereto, that manipulation of the device is assured because it will be found that when holding it between the thumb and fingers that the nozzle can be accurately guided due to the reinforced or stronger lower wall which rests on the fingers, and the device can thus be readily positioned prior to applying some pressure onto the upper wall to eject the content.

In the form shown in Figs. 4, 5 and 6 a cap 10 is associated with the nozzle 11, the device again having a less rigid upper wall 12 and a relatively more rigid lower wall with a sealed end 13.

The nozzle 11 is in this case formed specifically to allow injection to be effected into a body aperture or cavity or wound by presenting a smooth end on the nozzle 1 which is normally closed by means of a sealing member or projection 15 joined to the nozzle by means of a thin frangible membrane 16 just rearwardly of the extreme end 17 of the nozzle.

The sealing projection is adapted to be engaged by the cap 18 which has in it a shaped aperture 19 adapted to engage a correspondingly shaped end 20 on the sealing projection so that while a cap when it is in position on the sealing projection protects the end of the nozzle 11, allows the nozzle 11 to be unsealed by rotating or rocking the cap 18

to break the membrane 16 and thus cause the sealing projection to be withdrawn from the end of the nozzle 11 to which it was previously attached.

This action is shown in Figs. 5, 6 and 7 where in Fig. 5 the cap 18 is shown removed from the end of the nozzle 11 and thus is not in engagement with the sealing projection 15, but in Fig. 6 the engagement of the cap 18 on the sealing projection is illustrated, this being the normal position which the device would be stored or transported in that it would be ready for unsealing while the cap protected the operative end of the nozzle against contamination. In Fig. 7 is then shown the opened nozzle 11 and from this it will be seen that the end 17 is smooth because the break of the membrane is effected at the plane 21 which is remote from the end 17 and thus the fracture even if rough does not in any way present a jaggered portion at the end of the nozzle 11, this view showing the broken sealing projection 15 still held in the cap 18.

In Fig. 8 is shown a similar arrangement but in this case the nozzle 23 has a sealing projection 24 on it and again the junction is by means of a membrane 25 which can readily be fractured, but in this case a cap 26 is shown which is simply for the purpose of hygienically protecting the end of the nozzle 23 but can be removed as in the case of Figs. 5, 6 and 7 by the exertion of pressure on the cap 26 preferably in the direction of the arrow 27.

It would of course be feasible to completely omit the cap and to utilise a construction at the end of the nozzle,

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with a breakaway sealing projection, whereby breaking away can be effected by simply grasping the sealing projection, which in this case could be larger if required, with a forceps or pliers or the like which would be available to a Doctor or person using the device, in which case hygienic protection could readily be offered by simply enclosing the container in a sealed bag or the like after adequate sterilisation.

From the foregoing it will be realised that the unit can be moulded from a single piece of material such as nylon or one of the usual syringe plastics, and can be completely sealed with the content therein, so that a nozzle may be cut prior to expelling the content, or it could be fitted with a needle which could again be sealed or a sealed needle boss could be used which could be withdrawn prior to use, and if desired a blank boss could be formed on the moulding on to which the sealing cap can be placed when it is not in use on the nozzle or the like.

The needle could of course be protected by a needle sheath withdrawable from a boss on the container.

The method of sealing the open end can take any convenient form, such as heat sealing, the end being appropriately shaped to allow this.

Instead of using a simple membrane or diaphragm it would be possible to form this in part of a solid or rigid section by increasing the thickness thereof, retaining a marginal membrane to join it to the remainder of the container in which case pressure on two opposite sides will

cause the necessary ejection of the content by moving the one rigid part into substantial engagement with the other rigid part.

This would also permit aspiration in the case of a syringe in that a grip could be formed on the movable part of the membrane which would allow it to be pulled upwardly after the needle had been inserted into a patient to detect whether the needle is in a vein. The unit could be so constructed that by pressure on one part, say the edges 4, the internal area of the unit could be increased to effect this aspiration whereas when the part is oppositely moved it will act to express the content from the container.

Such a container can itself be carried in a sterile condition by placing it into a paper or similar envelope provided with tabs so that a completely sterile unit carried in such a pack can be released at the instant of use by pulling on the tabs to discharge the unit.

Thus it will be realised that the actual shape and construction of the unit can be very materially varied but the basic principle is that it will be formed to comprise a relatively rigid section which has the nozzle or needle or needle boss on it, whereby effective manipulation of same is possible, the unit however having one or more resilient sections either reinforced or otherwise, so shaped that pressure on them will allow the movable section to accommodate itself to the shape of the relatively rigid section to ensure that the content of the container will be

ejected through the needle or boss or nozzle with a minimum of loss of material and under the most hygienic conditions because, as stated, the unit can be formed of a single moulding having its wall thicknesses arranged appropriately to achieve the required results, which unit can be sealed after filling and can if desired be held under aseptic conditions until required.

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The Claims defining the invention are as follows:

1. An improved sealable squeezable dispensing container comprising a body comprised of two spaced walls of differing relative rigidity to form the container, the wall of greater rigidity being relatively rigid and joined to a nozzle terminating at its end in a smoothly contoured edge, the dispensing being achieved by deflecting the less rigid wall toward the relatively rigid wall, characterized in that the end of the nozzle is closed by a sealing member joined to the nozzle by a frangible membrane disposed interiorly of but adjacent the end of the nozzle, whereby when the sealing member is removed by fracturing the membrane, the nozzle is maintained at its end with the smoothly contoured edge. (17/6/66)

2. An improved sealable container according to Claim 1 wherein a cap engages the sealing member to protect the end of the said nozzle but is shaped to allow the sealing member to be withdrawn by fracturing the frangible membrane. (17/6/66)

3. An improved sealable container according to Claim 1 wherein the container is moulded in one piece from a plastics material to have the relatively rigid wall of greater thickness than the less rigid wall. (17/6/66)

4. An improved sealable container according to Claim 1 wherein the container is moulded in one piece from a plastics material and the relatively rigid wall is of substantially the same thickness as the less rigid wall but is shaped to give greater rigidity. (17/6/66)

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5. An improved sealable container according to Claim 4 wherein the shaped wall comprises corrugations extending towards the said nozzle. (17/6/66)

6. An improved sealable container according to any preceding claim wherein the less ~~relatively~~ rigid wall is concave to accommodate the underside of a thumb while the relatively rigid wall within it ~~and~~ terminates in the nozzle whereby the nozzle forms a substantially rigid structure with the wall, and wherein the less rigid wall joins to the marginal edges of the relatively rigid wall and extends over same to form between the said walls the cavity for the dispensible material, whereby the less rigid wall can be deflected into the more rigid wall by thumb pressure on the less rigid wall. (17/6/66)

Dated this 22nd day of March, 1971.

NOEL JAMES BONNIN, M.S. F.R.C.S.
F.R.A.C.S. and IAN HOWARD MUDIE
ROEGER,
By their Patent Attorneys,
COLLISON & CO.

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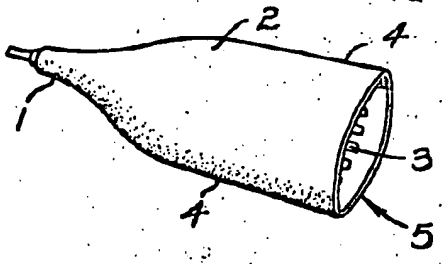


FIG 1

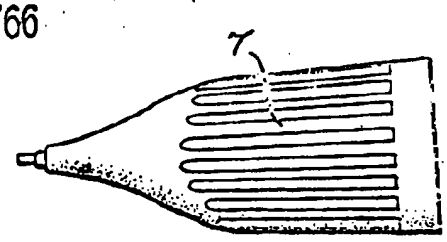
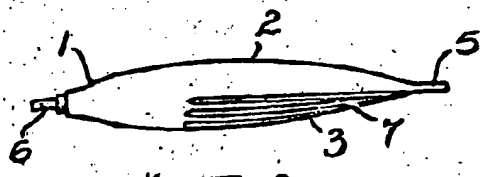


FIG 2



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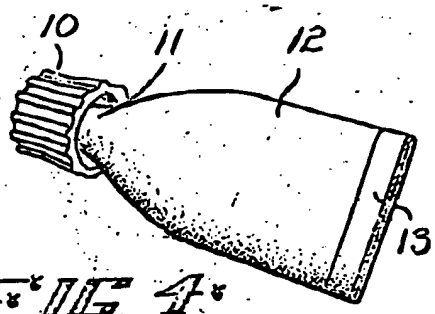

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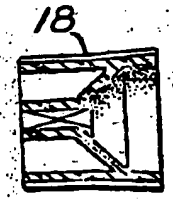


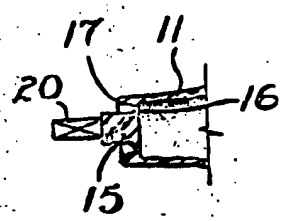


FIG 5

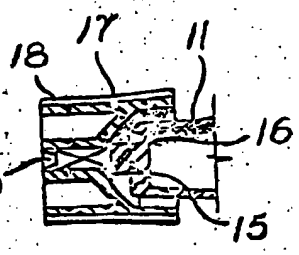
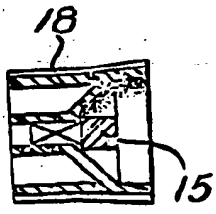


FIG 6



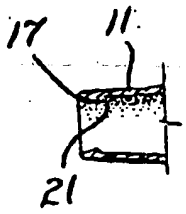


FIG 7

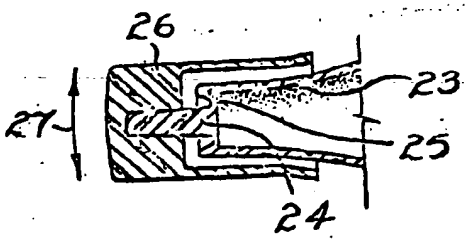


FIG 8

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